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|  **UNIVERSITY OF NIŠ** |
| **Course Unit Descriptor** | **Faculty**  | Faculty of Electronic Engineering |
| **GENERAL INFORMATION** |
| Study program  | Control Systems |
| Study Module (if applicable) | Automatic Control, Computer Control Systems and Measurement Techniques |
| Course title | Electrical Drive Control |
| Level of study | ☐ Bachelor ⊠ Master’s ☐ Doctoral |
| Type of course | ⊠ Obligatory ☐ Elective |
| Semester  | ⊠ Autumn ☐ Spring |
| Year of study  | First |
| Number of ECTS allocated | 4 |
| Name of lecturer/lecturers | Antić s. Dragan, Jovanović D. Zoran, Mitić B. Darko |
| Teaching mode |  ⊠ Lectures ⊠ Group tutorials ☐ Individual tutorials ☐Laboratory work ☐ Project work ☐ Seminar ☐Distance learning ☐ Blended learning ☐ Other |
| **PURPOSE AND OVERVIEW (max. 5 sentences)** |
| Introduction to the different types of controllers, control of electric drives coordinates, structures of controlled electrical drive, design methods of controlled electrical drives. |
| **SYLLABUS (brief outline and summary of topics, max. 10 sentences)** |
| Definition, significance, application and types of regulated electric drives. Mechanics of electrical drives (ED). Electrical drive kinematics with examples. Generalized model of motor, the regimes of energy transformation, the coordinate transformations. Electromechanical motor characteristics. DC motors, asynchronous and synchronous motors, step motors. Dynamic characteristics of electromechanical systems. Regulation of electric drive coordinates (moment, current, velocity, position). System controlled power converter – electrical drive. Typical structures of controlled electric drive. Methods for design of controlled electric drives. Classical methods. Modern methods. Control of a DC motor using linear controllers. The selection of the type of linear controller and parameters tuning. Control of asynchronous motor. Frequency control of rotation speed of asynchronous motor. The principle of vector control using field orientation. Design of identity observer. Control based on state space coordinates. |
| **LANGUAGE OF INSTRUCTION** |
| ⊠Serbian (complete course) ☐ English (complete course) ☐ Other \_\_\_\_\_\_\_\_\_\_\_\_\_ (complete course)☐Serbian with English mentoring ☐Serbian with other mentoring \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **ASSESSMENT METHODS AND CRITERIA** |
| **Pre exam duties** | **Points** | **Final exam** | **points** |
| **Activity during lectures** | **10** | **Written examination** | **20** |
| **Practical teaching** | **0** | **Oral examination** | **20** |
| **Exercises** | **20** | **Project** | **10** |
| **Teaching colloquia** | **20** | **OVERALL SUM** | **100** |
| **\*Final examination mark is formed in accordance with the Institutional documents** |